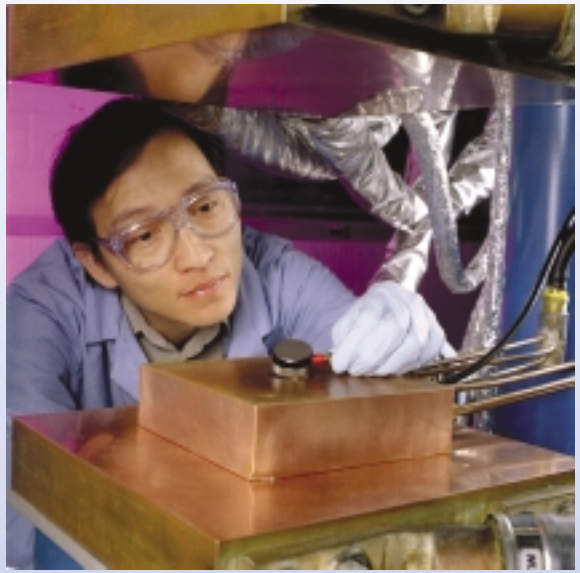
Nonintrusive High-Temperature Sensor

Argonne scientists, working with Superior Graphite Co. (Chicago, Ill.), developed a sensor that nonintrusively measures temperatures up to 3000°C with 2-3% accuracy. Initially the sensor is being used to monitor temperatures inside cylindrical die chambers as components are densified within a bed of graphite particles. The process can be used to manufacture parts from powders of many different materials, including metals, ceramics, and polymeric composite materials.



Argonne's sensor uses two ultrasonic transducers in converting speed-of-sound measurements to temperature readings.

- The sensor measures the speed of pulsed ultrasonic waves as they traverse any portion of a granular medium lying directly between two ultrasonic transducers.
- Transmitting and receiving transducers are placed on either side of a process die so they won't affect the sintering/densification procedure.

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